Listing of the Claims

1-11. (Cancelled)

12. (Original) A device for identifying a first analyte of a group of analytes in a biological sample, including:

a substrate including a first plurality of spaced-apart regions configured to bind the first analyte;

an optical source configured to generate a probe beam which illuminates the first plurality of spaced-apart regions in a sequential manner and interacts with the substrate to form a signal beam;

an interferometer configured to combine with an adaptive optical element a reference beam and the signal beam, the combination of the reference beam and the signal beam generating an output beam; and

a detector configured to detect the presence or absence of the first analyte based upon the output beam.

13. (Original) The device of claim 12, wherein the probe beam is reflected by the substrate to form the signal beam.

14. (Original) The device of claim 12, wherein the probe beam is transmitted through the substrate to form the signal beam.

15. (Original) The device of claim 12, wherein each of the first plurality of spaced-apart regions is separated from another of the first plurality of spaced-apart regions by one of a second plurality of regions configured to not bind the first analyte.

16. (Original) The device of claim 12, wherein the substrate includes a plurality of concentric tracks spaced such that the probe beam illuminates a single track, the first plurality of spaced-apart regions being disposed on the plurality of concentric tracks.

17. (Original) The device of claim 16, further comprising a motor configured to spin the substrate such that the probe beam is sequentially incident on the first plurality of spaced-apart regions of a first track, and a controller configured to control on which track of the plurality of tracks the probe beam is incident.

18. (Original) The device of claim 12, wherein the interferometer operates in a quadrature condition.

19-44. (Cancelled)

45. (New) The device of claim 15, further comprising:

a motor configured to spin the substrate;

wherein the probe beam generated by the optical source illuminates the first plurality of spaced-apart regions and the second plurality of regions in a sequential manner and interacts with the substrate to form the signal beam as the substrate spins; and

the detector indicates the presence of the analyte based on an interference characteristic of the output beam, the output beam having a first interference characteristic if the first analyte is bound to the substrate and a second interference characteristic if the first analyte is not bound to the substrate.

46. (New) The device of claim 45 wherein each of the first plurality of regions and the second plurality of regions are arranged in an alternating pattern, such that the first plurality of regions and the second plurality of regions form circular tracks on the substrate.

47. (New) The device of claim 45 wherein each of the first plurality of regions and the second plurality of regions are arranged in an alternating pattern, such that the first plurality of regions and the second plurality of regions form radially extending spokes on the substrate.

48. (New) The device of claim 47 wherein the first plurality of regions and the second plurality of regions are formed on the substrate by microfluidic printing.

49. (New) The device of claim 45 wherein the substrate includes a plurality of circular concentric tracks, each track including at least one of the first plurality of regions and at least one of the second plurality of regions, the first plurality of regions and the second plurality of regions being arranged in a repeating pattern.

50. (New) The device of claim 45 wherein the probe beam is generally normal to a surface of the substrate and the first plurality of regions has a first height and the second plurality of regions has a second height, the second height being offset relative to the first height.

51. (New) The device of claim 50 wherein the second height is offset relative to the first height by approximately one-eighth of a wavelength of the beam.

52. (New) The device of claim 50 wherein the second height is offset relative to the first height by approximately one-fourth of a wavelength of the beam.

53. (New) The device of claim 12 wherein the interferometer includes an adaptive holographic element.

54. (New) The device of claim 12 wherein the substrate includes a first surface lying substantially in a first plane and a second surface lying substantially in a second plane, the first plane being offset vertically from the second plane, each of the first plurality of regions lying on the first surface; and wherein the optical source is positioned relative to the substrate such that when the probe beam is directed at one of the first plurality of regions an interference characteristic is produced.

55. (New) The device of claim 54 wherein a first portion of the probe beam interacts with a target portion of the first surface holding one of the first plurality of regions, and a second portion of the probe beam interacts with a portion of the second surface adjacent to the target portion of the first surface, the first and second portions of the probe beam being combined to produce the output beam, the output beam having a first form when the first analyte is not bound to the target portion of the first surface and a second form when the first analyte is bound to the

target portion of the first surface.

56. (New) The device of claim 55 wherein the output beam includes the first portion of the probe beam reflected from the substrate and the second portion of the probe beam reflected from the substrate.

57. (New) The device of claim 56 wherein the output beam includes the first portion of the probe beam transmitted through the substrate and the second portion of the probe beam transmitted through the substrate.